



WBS 2.9.2

Far Detector Infrastructure

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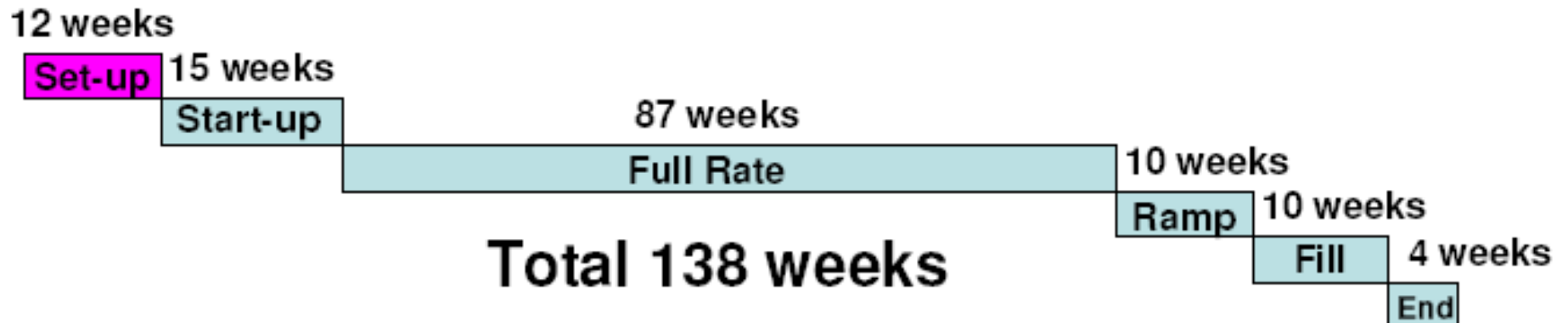
WBS 2.9.2 Far Detector Infrastructure

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WBS 2.9.2 Detector Infrastructure

- The detector infrastructure task happens during the 12 week Set-up Period
- All of these tasks begin after beneficial occupancy except for parts of WBS 2.9.2.6 which must be in place for the hiring process
- Tasks will begin slowly as the number of FTE's increases from 4 to 14 during this period





WBS 2.9.2.1 Electrical Infrastructure

WBS #	Title	M&S	Labor*	Total
2.9.2.1.1	Adhesive Dispenser	\$3,256	\$3,256	\$6,512
2.9.2.1.2	Block Pivoter	\$12,735	\$25,735	\$38,470
2.9.2.1.3	Scintillator Equipment	\$6,400	\$6,400	\$12,800
2.9.2.1.4	Electronics Racks Refrigerator Units	\$82,192	\$82,192	\$164,384
2.9.2.1.5	Machine Shop and Control Room	\$6,400	\$6,400	\$12,800
Total	Base Cost Only	\$110k	\$125k	\$235k

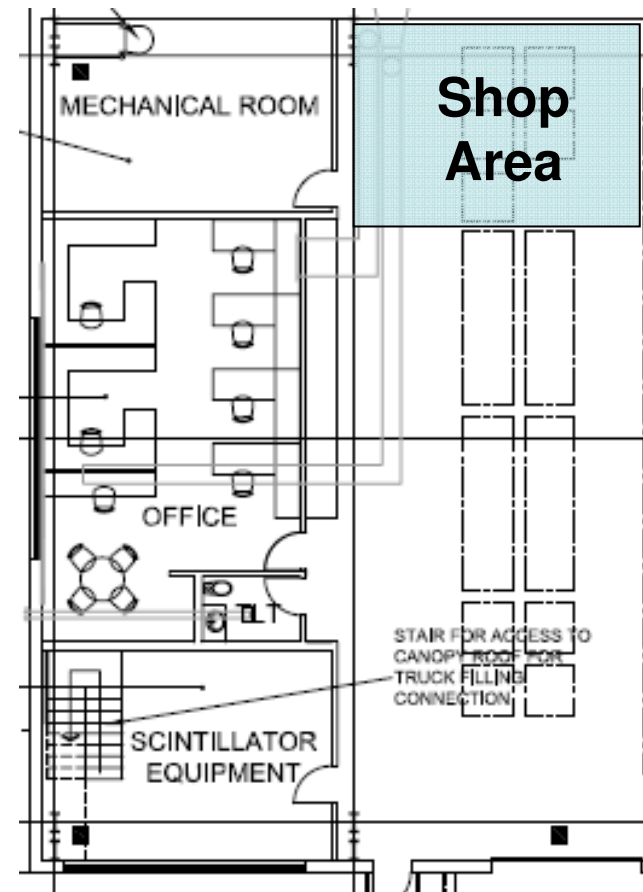
- *Labor listed here is electrical contractor
- Electrical work is to run power from breaker panels to equipment installed by WBS 2.9.4 after beneficial occupancy
- Contingency on these tasks are 70%



WBS 2.9.2.2-Machine Shop

WBS #	Title	M&S	Labor
2.9.2.2	Machine Shop	\$25k	180 FTE hrs. are covered in WBS 2.9.4

- M&S are in base cost, contingency should be 50% on this task
- Docbd-1192 describes machine shop area in detail
- Ash River is a very remote site so shop should be equipped with enough tools for most small projects
- The tools are needed right at beneficial occupancy since they are used for the installing the equipment



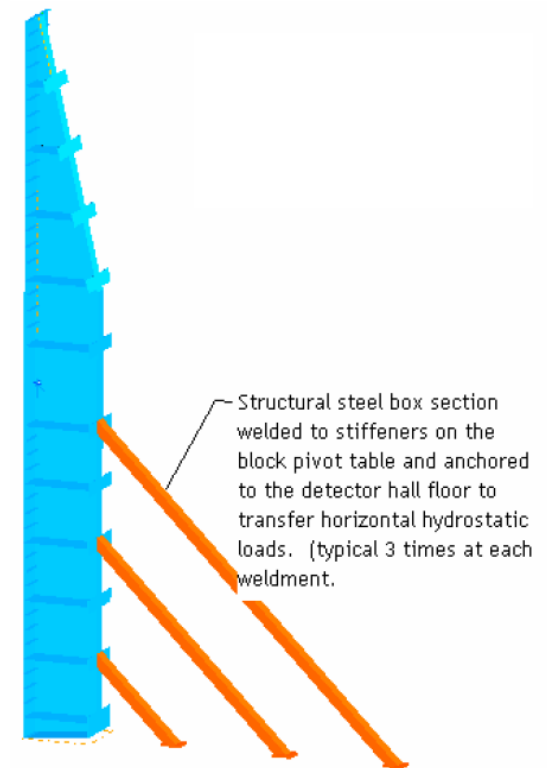


WBS 2.9.2.3-Bookends

WBS #	Title	M&S	Labor
2.9.2.3	S & N Bookends	Base Cost \$24k	320 FTE hrs-WBS 2.9.4

- The South Bookend wall is designed to withstand the required forces. WBS 2.9.2 task is to add a simple 30 cm wide by 2 cm thick spacer on the top. A complete survey is done to insure it's flatness
- The North Bookend is the Block pivoter permanently anchored to the floor on all 12 weldments
- M&S is base cost only, BoE has 100% contingency on this task

North Bookend

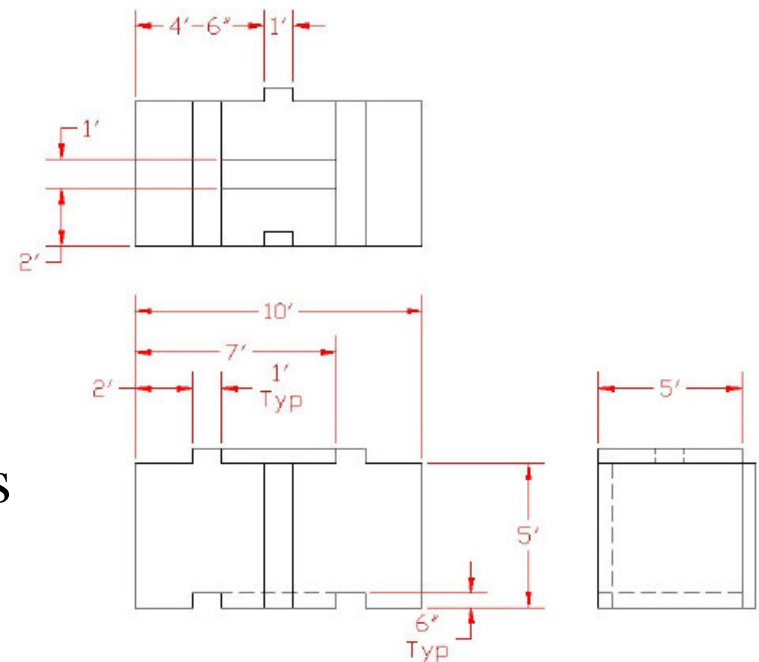




WBS 2.9.2.4-Shield Wall

WBS #	Title	M&S	Labor
2.9.2.4	Shield Wall	Base Cost \$951K	360 FTE hrs-WBS 2.9.4

- The Shield Wall is the last task completed at the Far Detector and is roughly 67' wide and 32' tall with 2 man doors in the bottom corners
- The wall consists of 42 large 10' x 5' x 5' pre-cast concrete blocks, plus many small blocks that can be moved in by hand to fill the remaining cracks
- Cost listed is a base cost estimated by FESS and the BoE has 30% contingency on this task



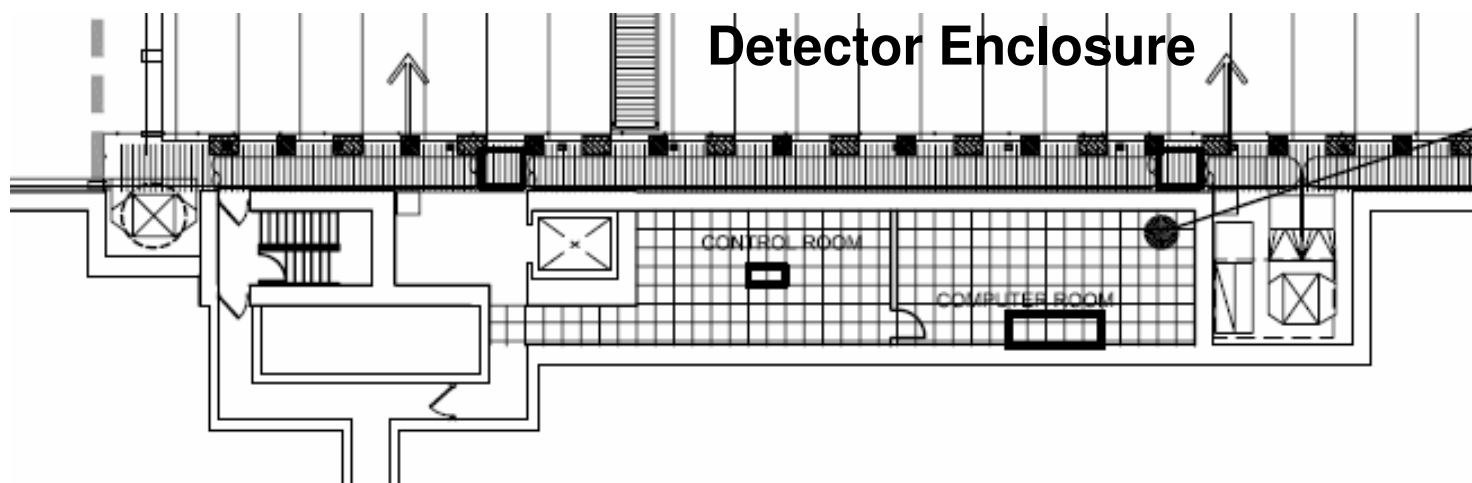
Pre-Cast Concrete Blocks



WBS 2.9.2.5-Control Room

WBS #	Title	M&S	Labor
2.9.2.5	Control Room	Base Cost \$12k	50 FTE hrs-WBS 2.9.4

- The control room is not needed until the first blocks start going up so this task can begin during the start-up period. The 50 FTE hours of labor is covered by Outfitting Technicians.
- Most of the Run Control equipment for detector operation comes from WBS 2.7.2.4. Costs shown here are base cost only add 25% contingency

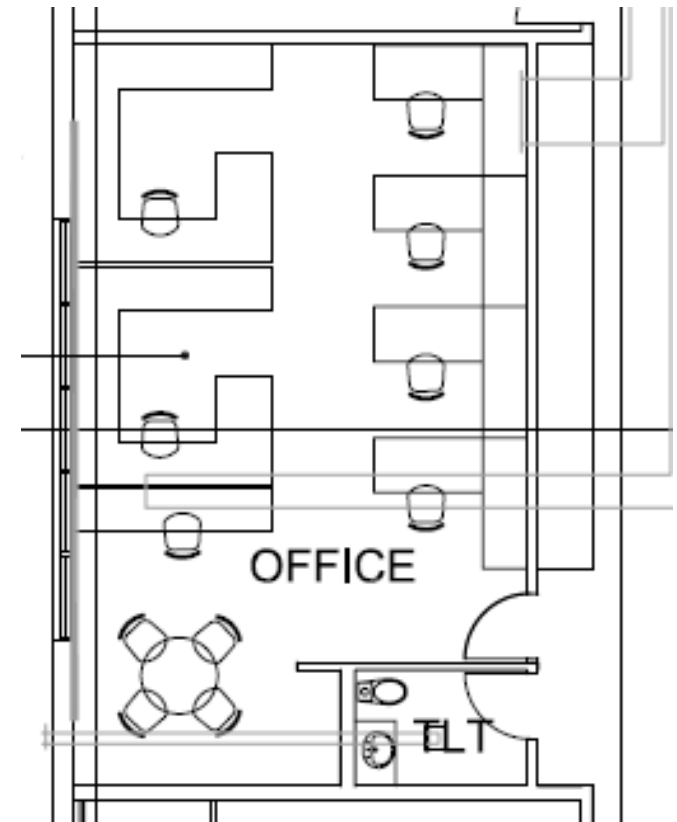




WBS 2.9.2.6-Office Area

WBS #	Title	M&S	Labor
2.9.2.6	Office Area	Base Cost \$46k	100 FTE hrs-WBS 2.9.4

- All M&S in this task are base cost with 25% contingency
- The office area is located in the Loading Dock Area and is needed immediately.
- Since the hiring process must start before beneficial occupancy a temporary trailer will be needed during the last 6 months of civil construction





WBS 2.9.2.7-Safety Equipment

WBS #	Title	M&S	Labor
2.9.2.7	Safety Equipment	\$84k	~4124 FTE hrs-Labor under WBS 2.9.4
	Training	\$34k	96 hrs/first year/40 hrs refresher each FTE
	Equipment	\$30k	180 FTE hours covered in WBS 2.9.4
	PPE	\$20k	

- WBS 2.9.2.7 Safety Equipment also includes all employee safety training. Because of remote site location additional first aid training is offered.
- All estimates for this task are base cost only. 25% contingency should be added to this task



Summary

- An average of contingency of 46% is used WBS 2.9.2 tasks
- Manpower levels are steadily increasing during most of this work so a 50% work efficiency should be used.
- 12 week set-up period not only includes all new employee training period but also final approval of installation procedures but visiting experts